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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,404	10/28/2003	Dennis J. Carroll	END920030031US1	7361

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SCHMEISER, OLSEN & WATTS
22 CENTURY HILL DRIVE
SUITE 302
LATHAM, NY 12110

EXAMINER
COLAN, GIOVANNA B

ART UNIT	PAPER NUMBER
2162	

DATE MAILED: 09/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

<table>
<tr><td rowspan="2">Office Action Summary</td><td>Application No.
10/696,404</td><td>Applicant(s)
CARROLL, DENNIS J.</td></tr>
<tr><td>Examiner
Giovanna Colan</td><td>Art Unit
2162</td></tr>
</table>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/28/2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-86* is/are pending in the application.

    4a) Of the above claim(s) *1-34* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *35-86* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/28/2003*.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   This action is issued in response to applicant filed application on 10/28/2006.

2.   Claims 35 – 86 are pending. Claims 1 – 34 are withdrawn form consideration.

3.   The information disclosure statement (IDS) submitted 10/28/2003. The
submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the
information disclosure statement is being considered by the examiner.

4.   Applicant's election with traverse of Group II in the reply filed on 10/28/2006 is
acknowledged. The traversal is on the ground(s) "that the subject matter of all claims 1
– 86 is sufficiently related that a thorough search for the subject matter of any one group
of claims would encompass a search for the subject matter of the remaining claims",
and that "the search and the examination of the entire application could be made
without serious burden". This is not found persuasive because, as discussed in office
action dated May 16, 2006, invention I has separate utility such as object oriented
database structure, particularly by generating a linked execution structure, masking, and
keying; invention II has separate utility such as manipulating data structure particularly
by sorting data. Invention I, and II are shown to be separately usable; thus, they are
distinct from each other.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

5.　　　The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

6.　　　Claims 35 – 48, 50 – 74, and 76 – 85 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Lawder (US Patent App. Pub. No. 2003/0004938 A1, filed: May

7, 2002) in view of Wagner (US Patent App. Pub. No. 2002/0174130 A1, filed March 20,

2001).

　　　　Regarding Claims 35, 50, 65, and 76, Lawder discloses a computer program

product, comprising:

　　　　a computer usable medium having a computer readable program code embodied

therein, said computer readable program code comprising an algorithm for sorting S

input sequences of binary bits of a value associated with each sequence (Page 7,

[0103], lines 1 – 8, Lawder)

　　　　said S sequences being stored in a memory device of a computer system prior to

said sorting, S being at least 2 (Page 2, [0024], lines 1 – 5, Lawder), each sequence of

the S sequences comprising K contiguous fields denoted left to right as F1, F2, . . . , Fk

(Fig. 7, Tree level 1, Tree Level 2, Tree Level 3, Page 8, [0123], lines 5 – 7, Lawder)

with corresponding field widths of W1, W2, . . . , Wk, (Fig. 7, item: "sub-square

sequence numbers (derived-keys)" shows "11", Page 8, [0129], lines 4 – 6, Lawder).

However, Lawder is silent with respect to ascending or descending order, and

execution time. On the other hand, Wagner discloses: sorting in ascending or

descending order of a value associated with each sequence (Page 1, [0011], lines 5 –

8, Wagner) and in a time period denoted as a sorting execution time (Page 4, [0042],

lines 1 – 2, Wagner). It would have been obvious to one of ordinary skill in the art at the

time the invention was made to incorporate the Wagner's teachings to the system

Lawder. Skilled artisan would have been motivated to do so, as suggested by Wagner

(Page 1, [0008], lines 1 – 4, Wagner), to provide improve the speed and efficiency of the

fundamental data operations of computer applications. In addition, both of the

references (Lawder and Wagner) teach features that are directed to analogous art and

they are directed to the same field of endeavor, such as, databases management

systems, sorting, nodes, and trees. This close relation between both of the references

highly suggests an expectation of success.

Furthermore, the combination of Lawder in view of Wagner discloses an

algorithm adapted to perform said sorting by executing the steps of:

designating S memory areas of the memory device as A1, A2, . . . , As (Page 2,

[0025], lines 7 – 9 and 13 – 14, data objects are then partitioned into ordered subsets

corresponding to pages of storage in a data store... next partition, thus the partitions are

ordered, Lawder);

setting an output index P=0 and a field index Q=0 (Fig. 10A, 3: next-match <= 0,

4:current-state <= state 0, Page 11, [0181], lines 12 – 14, Lawder);

providing a node E having S elements stored therein, said S elements consisting

of the S sequences or S pointers respectively pointing to the S sequences (Fig. 7,

"Node(or state)" and "n-points", Page 8, [0134], lines 5 – 11, Lawder; and Page 3,

[0032], lines 9 – 14, Wagner[1]); and

counter-controlled looping through program code, said looping including

iteratively executing said program code within nested loops (Fig. 10A, items 7, Page 13,

[0214], lines 8 – 11, Lawder; and Fig. 3, items 166 and 112, Page 4, [0036], lines 17 –

19, Wagner), said executing said program code including determining a truth or falsity of

an assertion that the elements in node E collectively include or point to no more than

one unique sequence U of the S sequences (Fig. 3, item 138, Page 4, [0036], lines 1 –

3, "whether all the characters of the key .. have been read", Wagner), and if said

assertion is determined to be false (Fig. 3, item 138: "N" and item 146: "N", lines 3 – 6,

"if not", Wagner):

then generating C child nodes from node E, each child node including all

elements in node E having a unique value of field FQ+1 (Fig. 3, item 150, Page

4, [0036], lines 6 – 8, "create new child node ...", Wagner[2]), said child nodes

denoted as E0, E1, . . . , EC-1 having associated field FQ+1 values of V0, V1, . . .

, VC-1, said child nodes E0, E1, . . . , EC-1 being sequenced such that V0<V1< .

. . <VC-1 Page 3, [0032], lines 9 – 14, Wagner); said generating followed by

incrementing Q by 1 (Fig. 10A, item 24: current-tree-level<=current-tree-level + 1,

Lawder), said incrementing Q followed by iterating from an index I=0 to I=C-1 in

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[1] Wherein the node object corresponds to the node E claimed; and the data queue corresponds to the S

steps of 1, wherein iteration I includes setting E=EI followed by returning to said

counter-controlled looping (Page 4, [0036], lines 8 – 10 and 17 – 19,

"current_node is set to the new child node object", Wagner);

else (Fig. 3, item 138: "Y", Page 4, [0036], lines 13 – 14, "if all of the

characters of the key have been read", Wagner) for each element in node E:

incrementing P by 1 (Fig. 4, item 166, Page 4, [0036], lines 16 – 19, "the data

flag of the node object is flagged", Wagner), next storing in AP either U or the

element pointing to U (Fig. 3, item 162, Page 4, [0036], lines 14 – 17, the data

object is pushed in to the data queue of the node object...", Wagner), and lastly if

all iterations of said outermost loop have not been executed then returning to

said counter-controlled looping else exiting from said algorithm (Page 4, [0036],

lines 17 – 19, Wagner).

Regarding Claims 36, 51, 66, and 77, the combination of Lawder in view of

Wagner discloses a computer program product, wherein said algorithm is not adapted

to execute comparing a value of a first sequence of the S sequences with a value of a

second sequence of the S sequences (Page 2, [0022], lines 4 – 9, Wagner[3]).

Regarding Claims 37, 52, 67, and 78, the combination of Lawder in view of

Wagner discloses a computer program product, wherein the sorting execution time is a

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sequences claimed.
[2] Wherein the node ID corresponds to the unique value of filed FQ + 1 claimed.
[3] Wherein the step of utilizing a sort algorithm by preserving the initial order of items with equal keys
corresponds to the step of utilizing an algorithm that is not adapted to execute comparing as claimed.

linear function of a sequence length comprised by each sequence of the S sequences

(Page 2, [0022], lines 4 – 6, Wagner).

Regarding Claims 38, 53, 68, and 79, the combination of Lawder in view o

Wagner discloses a computer program product, wherein the sorting execution time is a

linear or less than linear function of S (Page 2, [0022], lines 4 – 6 and 13 – 15, Wagner).

Regarding Claims 39, 54, 69, and 80, the combination of Lawder in view off

Wagner discloses a computer program product, wherein the sorting execution time is

essentially independent of an extent to which the S sequences are ordered in the

memory device, prior to said sorting, with respect to said associated values (Page 2,

[0022], lines 12 – 13, Wagner).

Regarding Claims 40, 55, 70, and 81, the combination of Lawder in view of

Wagner discloses a computer program product, wherein the sorting execution time is a

decreasing function of a data density of the S sequences (Page 2, [0022], lines 15, "less

than log n", Wagner).

Regarding Claims 41, and 56, the combination of Lawder in view of Wagner

discloses a computer program product, wherein the S elements consist of the S

pointers, wherein the node E having the S sequences prior to said sorting includes a

linked list that comprises the S pointers, and wherein each child node having pointers

therein includes a linked list that comprises said pointers therein (Fig. 7, wherein the pointers pointing at "Tree Level 1" from "0" to "2" to "0" corresponds to the linked list claimed, Page 8, [0123], lines 5 – 10, Lawder).

Regarding Claims 42, 57, 71, and 82, the combination of Lawder in view of Wagner discloses a computer program product, wherein the S sequences each represent a variable-length character string (Page 11, [0178], lines 1 – 4, "bit-string", Lawder), wherein each of the S character strings consists of the K contiguous fields (Fig. 7, Tree level 1, Tree Level 2, Tree Level 3, Page 8 and 11, [0123] and [0178], lines 5 – 7 and 2 – 3; respectively, Lawder), wherein K is a sequence-dependent variable subject to W1=W2= . . . =WK=one byte consisting of a fixed number of binary bits for representing one character (Fig. 7, item: "sub-square sequence numbers (derived-keys)" shows "11", Page 8, [0129], lines 4 – 6, Lawder).

Regarding Claims 43, 58, 72, and 83, the combination of Lawder in view of Wagner discloses a computer program product, wherein the S sequences each represent a fixed-length character string (Page 11, [0178], lines 1 – 4, "bit-string", Lawder[4]), wherein each of the S character strings consists of the K contiguous fields (Fig. 7, Tree level 1, Tree Level 2, Tree Level 3, Page 8 and 11, [0123] and [0178], lines 5 – 7 and 2 – 3; respectively, Lawder), wherein K is a sequence-dependent variable subject to W1=W2= . . . =WK=one byte consisting of a fixed number of binary bits for

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[4] Wherein the nk corresponds to the fixed length claimed.

representing one character (Fig. 7, item: "sub-square sequence numbers (derived-keys)" shows "11", Page 8, [0129], lines 4 – 6, Lawder).

Regarding Claims 44, and 59, the combination of Lawder in view of Wagner discloses a computer program product, wherein the S sequences consist of S fixed-length words such that each of the S words has N binary bits, wherein N is at least 2 (Fig. 7, item: "sub-square sequence numbers (derived-keys)" shows bits "11", Page 8, [0129], lines 4 – 6, Lawder; and Page 2, [0024], lines 1 – 3, Wagner).

Regarding Claims 45, and 60, the combination of Lawder in view of Wagner discloses a computer program, wherein the S words each represent an integer (Page 5, [0076], lines 9 – 15, Lawder; and Page 3, [0034], lines 5 – 9, Wagner).

Regarding Claims 46, and 61, the combination of Lawder in view of Wagner discloses a computer program product, wherein the algorithm is further adapted to execute determining a leftmost significant bit position of the S words collectively, and wherein the leftmost bit position of field FI is the leftmost significant bit position of the S words collectively (Page 8 and 12, [0128] and [0192], lines 1 – 3 and 1 – 3; respectively, Lawder).

Regarding Claims 47, and 62, the combination of Lawder in view of Wagner discloses a computer program product, wherein the S words each represent a floating

point number having the following fields contiguously ordered from left to right: a sign

field, an exponent field, and a mantissa field (Page 8, [0135], lines 1 – 3, Lawder).

Regarding Claims 48, and 63, the combination of Lawder in view of Wagner

discloses a computer program product, wherein generating the C child nodes from node

E comprises performing (M AND X) or (X AND M) with a mask M for each sequence X

in node E, wherein the mask M is keyed to the field FQ+T, and wherein the bit positions

of the mask M relating to the field FQ+1 each have a 1 bit, and wherein the remaining

bit positions of the mask M each have a 0 bit (Page 17, lines 15 – 33, Lawder).

Regarding Claims 73, and 84, the combination of Lawder in view of Wagner

discloses a computer program product, wherein the S sequences consist of S fixed-

length integers such that each of the S integers has N binary bits, wherein N is at least

2 (Fig. 7, item: "sub-square sequence numbers (derived-keys)" shows bits "11", Page

8, [0129], lines 4 – 6, Lawder).

Regarding Claims 74, and 85, the combination of Lawder in view of Wagner

discloses a computer program product, wherein the S sequences consist of S fixed-

length floating point numbers (Page 6, [0101], lines 13 – 16, Lawder), each of said

floating point numbers having the following fields contiguously ordered from left to right:

a sign field, an exponent field, and a mantissa field (Page 8, [0135], lines 1 – 3,

Lawder).

7.   Claims 49, 64, 75, and 86 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Lawder (US Patent App. Pub. No. 2003/0004938 A1, filed: May 7,

2002) in view of Wagner (US Patent App. Pub. No. 2002/0174130 A1, filed March 20,

2001), and further in view of Call (US Patent App. Pub. No. 2002/0165707 A1, filed:

February 26, 2001).

     Regarding Claims 49, 64, 75, and 86, the combination of Lawder in view of

Wagner discloses all the limitations as disclosed above including: a computer program

product, wherein S is at least 1000 (Fig. 12B, item showing: "Therefore, next-

match=1000????", Lawder), W1, W2, . . . , WK (Fig. 7, item: "sub-square sequence

numbers (derived-keys)" shows "11", Page 8, [0129], lines 4 – 6, Lawder), and sorting

execution time (Page 4, [0042], lines 1 – 2, Wagner) . However, the combination of

Lawder in view of Wagner is silent with respect to Quicksort. On the other hand, Call

discloses a sorting execution time is less than a Quicksort execution time for sorting the

S sequences via execution of a Quicksort sorting algorithm by said processor (Page 6,

[0069], lines 10 – 15, Call). It would have been obvious to one of ordinary skill in the art

at the time the invention was made to incorporate the Call's teachings to the system of

the combination of Lawder in view of Wagner. Skilled artisan would have been

motivated to do so, as suggested by Call (Page 1, [0010], lines 1 – 5, Call), to permit

more efficient execution of processing functions of the type typically performed by data

processors. In addition, the applied references (Lawder, Wagner, and Call) teach

features that are directed to analogous art and they are directed to the same field of

endeavor, such as, databases management systems, sorting, bits, and character

strings. This close relation between the applied references highly suggests an

expectation of success.

Prior Art Made Of Record

1.   Lawder (US Patent App. Pub. No. 2003/0004938 A1, filed: May 7, 2002) discloses a method of storing and retrieving multi-dimensional data suing the Hilbert curve.

2.   Wagner (US Patent App. Pub. No. 2002/0174130 A1, filed March 20, 2001) discloses string tree utility data structure and order n sort.

3.   Call (US Patent App. Pub. No. 2002/0165707 A1, filed: February 26, 2001) discloses methods and apparatus for storing and processing natural language text data as a sequence of fixed length integers.

4.   Feldmeier et al. (US Patent App. Pub. No. 2002/0032681 A1) discloses partially-ordered cams used in ternary hierarchical address searching/sorting.

Points Of Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Giovanna Colan whose telephone number is (571) 272-2752. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JOHN BREENE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Giovanna Colan
Examiner
Art Unit 2162
August 30, 2006